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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/678,427

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Alan R. Arthur

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EXAMINER

ECHELMAYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/08/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/678,427

Applicant(s)

ARTHUR, ALAN R.

Examiner

Alix Elizabeth Echelmeyer

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 41-55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-26, 41-45, 47-52, 54 and 55 is/are rejected.
- 7) ☒ Claim(s) 18, 27, 46 and 53 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office Action is in response to the amendment filed December 13, 2006. Claims 1, 11, 14, 17-27, 41, 43 and 45-49 have been amended. Claims 28-40 have been cancelled in response to the Restriction Requirement (see Office Action dated September 14, 2006). Claims 50-55 have been added. Claims 1-27 and 41-55 are pending and are rejected finally for the reasons given below.

### ***Specification***

2. The examiner acknowledges the amendments to the specification.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 6, 9, 10, 41, 42, 45, 47, 49, 50, 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Wheeler et al. (US Patent 4,609,037).

Wheeler et al. teach a variable temperature apparatus for heating and cooling an article (abstract; column 1 lines 56-69). The apparatus consists of a first plate having low heat capacity and a second plate having high heat capacity, which serves as a heat

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sink (column 1 lines 61-68). As for claim 52, the apparatus further includes a vacuum between the plates.

During the heating phase, the plates do not contact (column 2 lines 22-31).

Regarding claims 45, 47 and 50, when the first plate reaches a certain temperature, the vacuum is released and a spring presses the plates closer together to contact the heat sink and the heating core (column 3 lines 32-36). The spring serves as the responsive coupling member of the instant application.

As for claims 6 and 49, the system of Wheeler et al. would inherently have a sensor, since the operation is dependent on the temperature of the wafer chuck. There would have to be a way for the system to determine when to bring the heat sink into contact with the heat generator.

Regarding claims 9 and 10, the heat sink is made of aluminum (column 2 lines 47-49).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Oishi (JP 03-012998).

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The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach a spring to force the heat sink and heat generating core into contact but fail to teach that the spring is a shape memory alloy.

Oishi teaches two plates serving as heat sinks that are coupled with heat releasing equipment. A shape memory alloy between the two plates is designed to change the heat resistance between the plates based on temperature (abstract). The alloy deforms under certain temperatures, causing the plates to be closer or further apart (see Figures 1 and 2). The plates make contact through the shape memory alloy when the alloy is flat, but are separated when the alloy is in its zig-zag position.

It would be desirable to use the shape memory alloy to contact to the heat sink and heat generator of Wheeler et al. since the action caused by the shape memory alloy is easy and responds to temperature conditions (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use the shape memory alloy of Oishi in the apparatus of Wheeler et al. since it would ease operation and make the system respond to temperature conditions.

7. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al.

The teachings of Wheeler et al. as discussed above are incorporated herein.

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Wheeler et al. teach that the spring pushes the plates together after the biasing vacuum is released. Wheeler et al. further teach that a negative vacuum may be applied to push the plates into even closer contact (column 3 lines 38-42).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the spring as the biasing member and the vacuum as the means for contacting the plates, since it would require less energy to keep the plates apart, as the vacuum would not have to be applied since the spring would do the work to keep the plates apart. It has been held that rearranging parts of an invention involves only routine skill in the art. MPEP 2144.04 (VI).

8. Claims 5 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Higashiyama et al. (US Pre-Grant Publication 2004/0180247).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach a spring to force the heat sink and heat generating core into contact but fail to teach that the spring is a shape memory alloy.

Higashiyama et al. teach a valve that is controlled by a material that changes its shape depending on temperature, such as a bimetal. The opening and closing of the valve is controlled by hardware, reducing temperature variation ([0131]).

It would be desirable to use the bimetal of Higashiyama et al. in the apparatus of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the bimetal of Higashiyama et al. in the system of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

9. Claims 43 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Maeda et al. (US Pre-Grant Publication 2001/0023591).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach the variably insulated system, but fail to teach a fan to further cool the system.

Maeda et al. teach a heat sink for cooling the heat generating CPU of a notebook computer. Additionally, a fan is used to cool the heat sink, creating a greater temperature differential between the heat sink and the CPU, making it cool more effectively (abstract; Figure 8; [0014]; [0016]).

It would be desirable to use the fan of Maeda et al. in the heat sink of Wheeler et al. in order to more effectively cool the system.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fan to cool the heat sink of Wheeler et al. further, as taught by Maeda et al., since the fan would make the heat sink more effective in removing heat from the system.

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10. Claims 7, 8, 11, 12, 14, 16, 19, 21, 22, 25, 26, 44 rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. (US Patent 5,759,278).

The teachings of Wheeler et al. as discussed above are incorporated herein.

Wheeler et al. teach a variably insulated system but do not specifically teach a solid oxide fuel cell may be cooled by the system.

As for claims 16 and 25, the system of Wheeler et al. would inherently have a sensor, since the operation is dependent on the temperature of the wafer chuck. There would have to be a way for the system to determine when to bring the heat sink into contact with the heat generator.

Gillett et al. teach a solid oxide fuel cell capable of operating at temperatures over 650°C (abstract; column 2 lines 46-66). The solid oxide fuel cell is contained within insulating housing to control the temperature, resulting in cost and performance advantages.

The insulating system of Wheeler et al. would further improve the advantages of Gillett et al. but allowing more control over the insulating system, since combining the system of Gillett et al. with the additional heat sink taught by Wheeler et al. would provide added insulation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the insulating system of Wheeler et al. with the solid oxide fuel cell system of Gillett et al. in order to improve the insulating housing already present in Gillett et al.



11. Claims 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claims 11 and 21 above, and further in view of Oishi.

The teachings of Wheeler et al., Gillett et al. and Oishi as discussed above are incorporated herein.

Wheeler et al. in view of Gillett et al. teach a spring to force the heat sink and fuel cell into contact but fail to teach that the spring is a shape memory alloy.

Oishi teaches two plates serving as heat sinks that are coupled with heat releasing equipment. A shape memory alloy between the two plates is designed to change the heat resistance between the plates based on temperature (abstract). The alloy deforms under certain temperatures, causing the plates to be closer or further apart (see Figures 1 and 2). The plates make contact through the shape memory alloy when the alloy is flat, but are separated when the alloy is in its zig-zag position.

It would be desirable to use the shape memory alloy to contact to the heat sink and fuel cell of Wheeler et al. in view of Gillett et al. since the action caused by the shape memory alloy is easy and responds to temperature conditions (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use the shape memory alloy of Oishi in the apparatus of Wheeler et al. in view of Gillett et al. since it would ease operation and make the system respond to temperature conditions.

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12. Claims 15 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claims 11 and 21 above, and further in view of Higashiyama et al.

The teachings of Wheeler et al., Gillett et al. and Higashiyama et al. as discussed above are incorporated herein.

Wheeler et al. in view of Gillett et al. teach a spring to force the heat sink and fuel cell into contact but fail to teach that the spring is a bimetal.

Higashiyama et al. teach a valve that is controlled by a material that changes its shape depending on temperature, such as a bimetal. The opening and closing of the valve is controlled by hardware, reducing temperature variation ([0131]).

It would be desirable to use the bimetal of Higashiyama et al. in the apparatus of Wheeler et al. in view of Gillett et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the bimetal of Higashiyama et al. in the system of Wheeler et al. in view of Gillett et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

13. Claims 17 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claims 6 and 11 above, and in further view of Louie et al. (US Patent 6,296,032).

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The teachings of Wheeler et al. and Gillett et al. as discussed above are incorporated herein.

Neither Wheeler et al. nor Wheeler et al. in view of Gillett et al. teach a solenoid valve for contacting heat sink and heat generator.

Louie et al. teach a solenoid to connect an upper heat sink to a lower heat sink (column 8 lines 53-57).

It would be desirable to use the solenoid of Louie et al. in the apparatus of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the solenoid of Louie et al. in the system of Wheeler et al. since it allows the apparatus to be controlled by hardware, reducing temperature variation.

14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Gillett et al. as applied to claim 11 above, and in further view of Maeda et al.

The teachings of Wheeler et al., Gillett et al. and Maeda et al. as discussed above are incorporated herein.

Wheeler et al. in view of Gillett et al. teach the variably insulated system, but fail to teach a fan to further cool the fuel cell.

Maeda et al. teach a heat sink for cooling the heat generating CPU of a notebook computer. Additionally, a fan is used to cool the heat sink, creating a greater temperature differential between the heat sink and the CPU, making it cool more effectively (abstract; Figure 8; [0014]; [0016]).

It would be desirable to use the fan of Maeda et al. in the heat sink of Wheeler et al. in view of Gillett et al. in order to more effectively cool the system.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fan to cool the heat sink of Wheeler et al. in view of Gillett et al. further, as taught by Maeda et al., since the fan would make the heat sink more effective in removing heat from the system.

***Allowable Subject Matter***

15. Claims 18, 27, 46 and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is an examiner's statement of reasons for allowance: the prior art fails to teach or render obvious a shape memory alloy strung between a plurality of posts to force contact between a heat sink and heat generating core.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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